OUR planet

The United Nations Environment Programme magazine for environmentally sustainable development

UNEP

TRANSPORT & COMMUNICATIONS

● **Shoichiro Toyoda**
Driving change

● **Siv Fridleifsdottir**
Clearing the bottlenecks

● **Lim Swee Say**
Commuting sustainably

● **Jorma Ollila**
Breaking free

● **M. S. Swaminathan**
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Entering the city century

World Environment Day: **Kofi A. Annan**
Rosa Elena Simeón Negrin **Mercedes Bresso and Giuseppe Gamba**

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Editorial

KLAUS TÖPFER
United Nations Under-Secretary General and Executive Director, UNEP

Four times a month I stroll next door from my office in Nairobi to meet Secretary-General Kofi Annan and other senior members of the United Nations. We exchange views on pressing global issues ranging from Kosovo and human rights to global warming and water shortages.

Only a few years ago this would have necessitated time-consuming air travel. For while I am in Kenya, the other participants are scattered across the globe from New York to Geneva. But modern telecommunications – a major theme of this year's international World Environment Day celebrations – is transforming the way the world works; and this includes the United Nations.

Positive signs

It also offers hope for reducing some of the great environmental threats of this new millennium. The boom in telecommunications, the Internet and the so called 'new economy' may be the beginning of a break with the pollution patterns of the past, helping us to grow economies without also increasing the amounts of carbon dioxide pouring into the atmosphere.

Kodak, the camera company, estimates that live videoconferencing – as in my monthly United Nations meetings – causes 99 per cent less global warming than travelling 1,000 kilometres by air for face-to-face talks. Similarly telecommuting, where people work from home using personal computers and electronic links, reduces the need to heat and light big offices and the amount of fuel burnt by staff driving to work. More than half the managers at AT&T, the telecoms company, telecommute one day a week, saving 80,000 tonnes of carbon dioxide annually from reduced travel. The International Data Corporation forecasts that home-based offices will grow from 12 million in 1997 to 30 million by 2002 in the United States alone. We are seeing similar patterns in Europe and elsewhere in the world.

New industry

Meanwhile the Internet is creating new kinds of businesses, less energy intensive than such traditional ones as steel or chemicals manufacturing. Buying a book online uses around 6 per cent of the energy normally involved in purchasing the latest best-seller from a shop, according to the US-based Center for Energy and Climate Solutions.

Clearly technology should never be seen as a silver bullet, tackling all the world's environmental ills. Many people will need to travel physically to offices and factories for part if not all of their working lives. For many in the developing world the Internet remains science fiction.

Living too much in a 'virtual world' cannot be healthy either. We need to 'Connect with the World Wide Web of Life' – this year's World Environment Day slogan – and see with our own eyes the beauty and the threats to the natural world as much as connect with the World Wide Web. Many important political agreements can only be secured by sitting down with the various parties and hammering out a deal over a drink, a sandwich or a United Nations conference table. There can also be dangers in placing too much faith in new technological developments: the future is another country full of surprises.

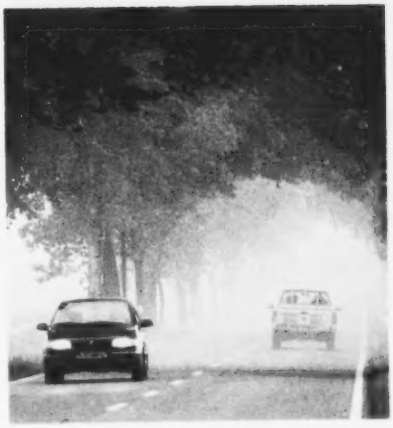
Improved transport

Sustainable transport is another crucial theme of this year's World Environment Day. Emissions from cars, for example, add to global warming, carry health risks and dirty public buildings. The car needs to become our servant rather than our master. Lim Swee Say, Singapore's Acting Minister for the Environment, tells us in this special edition of UNEP's *Our Planet* how his country has managed to get 63 per cent of all journeys carried out by public transport and is aiming to increase this to 75 per cent.

At the beginning of this new millennium, we stand on a precipice with environmental degradation seemingly accelerating everywhere. But we have a great deal of knowledge about what needs to be done – and the technology and human ingenuity to bring abut real and lasting change. Let us, as individuals and communities, face the challenges and bring all our skills to bear not just on World Environment Day but in the days and decades to come ■

DRIVING CHANGE

SHOICHIRO TOYODA describes what his company, and others, are doing to pioneer sustainable mobility



Hartmut Schwarzbach/Still Pictures

To the automobile industry, environmental issues are much more than something to be reckoned with as a result of regulations. The environment cannot be ignored, but must be dealt with proactively as the industry remakes itself in the 21st century.

This mindset led Toyota in April 2000 to redefine and reissue its *Earth Charter*, first published in 1992. Toyota's basic principles, as defined in the new *Earth Charter*, are:

1. **To contribute towards a prosperous 21st century society.**
2. **To pursue environmentally sound technologies.**
3. **To incorporate voluntary programmes.**
4. **To work in cooperation with society.**

Based upon these principles, Toyota is implementing a consolidated environmental management plan among 425 supplier and subsidiary companies at home and abroad.

Toyota is of the opinion that major technological breakthroughs are needed to deal effectively with environmental issues in general and with global warming specifically. While it is true that besides improving conventional engine technology we have also achieved a revolutionary hybrid system, we must continue to pursue improvements in fuel efficiency. That means meeting new challenges and commercializing new technologies, such as fuel cells. At the same time,

We must reach beyond the automobile as an independent product

we must reach beyond the automobile as an independent product and use information technology and other new technologies to enable cars and traffic systems to work together in solving global warming issues, while offering greater convenience to motorists and society alike. In this way, the mobility we want and need can be achieved.

One important development is occurring under the auspices of the World Business Council for Sustainable Development (WBCSD). This is the Sustainable Mobility Project, which goes beyond industry and corporate boundaries to provide a forum where the future of automobiles and human mobility can be addressed. The project is pursuing ways and scenarios that will define tomorrow's mobility within society.

Some of the major companies that are members of the WBCSD are BP, Daimler-Chrysler, Ford, General Motors, Michelin, Norsk Hydro, Shell, Volkswagen and Toyota. I join Mr. Harry J. Pierce, Vice Chairman, General Motors Corporation and Mr. Phil Watts, Group Managing Director, Royal Dutch/Shell Group as a co-chairman of the Sustainable Mobility Project.

Integrating the issues

The project, which began last year, will continue for three years and consider such issues as public health and safety, time lost as a result of traffic congestion, exhaust emissions and atmospheric pollution, changes in weather patterns, use of resources, waste treatment issues, effects on economic growth, and other issues affecting mobility. It will assess both the positive and negative effects of land, sea and air links, and examine whether they are sustainable and, if not, how they might be made so. Through this work, covering all the issues affecting mobility, the project will develop a vision aiming at sustainable mobility in 2030.

To increase confidence in the project, we will form an assurance group, consisting of eminent individuals and experts, to provide advice. This project does not plan to get stuck in the thinking of industry alone. Rather, the subject of mobility will be analysed and discussed from all angles. This will enable us to consider the fulfilment that is provided to humankind through mobility. Within the project, we are working hard to produce an interim report to be released in 2002 in advance of the Rio+10 conference; and the main and final report, *Sustainable Mobility 2030*, is planned to be released by mid-2003.

A key resource

In conclusion, I would like to add a personal observation. When speaking of industrial visions for the 21st century, sustainable development is a key phrase matching globalization and the information technology revolution in importance. Investment in the environment is most often made from the long-term view of harmonizing society and the natural environment. That means, of course, that the success of such endeavours depends greatly upon the perception of industrial executives. Therefore, the ability to develop practical 'environmental' programmes should be seen as a very important management resource ■

Dr. Shoichiro Toyoda is Honorary Chairman and Member of the Board of Toyota Motor Corporation (www.global.toyota.com).

Dr. Toyoda inspects a model of a newly developed engine.

On World Environment Day 1999, Toyota Motor Corporation received a UNEP Global 500 award. This was in recognition of the launching and mass production of the Prius, the world's first hybrid car; the setting up of environmental management systems; open information about environmental policies; and appropriate communications. Encouraged by this award, Toyota is placing even more emphasis on its environmental programmes.

Clearing the bottlenecks

SIV FRIDLEIFSDOTTIR explores how to make the 21st century an age of renewable energy

From the moment that the first woman, or man, learned to harness fire, energy use has been central to the progress of humankind. The industrial revolution was powered by coal. Oil is the lifeblood of the modern economy. Meanwhile, lack of access to modern energy services is a serious obstacle to development for more than one third of mankind.

Burning hydrocarbons is – and has been – our main source of energy. Dung and vegetation are still important fuels in many parts of the world, but the 20th century was a century of fossil fuels – coal, natural gas, but above all, oil. These fuel sources will eventually run out, although new reserves are constantly being discovered. The true limit to the use of fossil fuels, however, is not supply, but the effect their emissions have on the air we breathe and on the atmosphere. We are faced with climatic disaster unless we can find alternative ways to quench our thirst for energy.

Is there an alternative? Fortunately, yes. The Earth is awash with clean and renewable energy. Wind, hydro, geothermal and solar energy could easily meet our present and future needs, combined with modern technologies for the sustainable use of biomass fuels. Technology to harness this bountiful energy has been evolving quickly. Scenarios indicate that renewables will contribute 20-50 per cent of energy supplies in the second half of the 21st century; perhaps even as much as 80 per cent by its end. There is little doubt that this will be the renewable energy century.

Yet progress is slow. If we exclude traditional biomass, renewables now account for only 4-5 per cent of world energy use. Fossil-fuel technologies are still often the cheapest option, and certainly the most easily available. Can we do anything to bring the renewable energy future closer, other than wait for further technological progress?

Again, the answer is 'yes'. The World Energy Council estimates that the so-called 'new renewables' – solar, wind, geothermal and similar – might contribute 3-4 per cent of the world's energy needs in 2020 with minimum policy support, but 8-12 per cent with major policy support. Active policy support could thus make a huge difference, both in terms of more people enjoying basic access to energy, and in curbing air pollution and greenhouse gas emissions.

Finding the right price

This support can take many forms. One is setting the right price signal. At present, the health and environmental costs of fossil fuels are often not calculated in their market price – and nor are the corresponding benefits of renewables. Simply correcting the price signals could enable renewables more easily to pass the threshold of becoming competitive.

We also need to improve access to proven and cost-effective renewable technologies, especially in developing

countries. Capacity building, training experts and technology cooperation can stimulate their introduction.

Geothermal energy, for example, is now exploited in 58 countries, and has immense potential, not least in developing nations. The technology is proven and cost effective: in some developing countries, it is the least costly option for new electricity generation capacity. In countries where local expertise and capacity has been acquired – such as the Philippines, Kenya and some Central American countries – it has become an important and growing source of power, with 8-22 per cent of total electricity generated from geothermal steam. The bottlenecks hindering its more intense and widespread use are not a lack of geothermal fields or proven technologies, but poor access to finance as well as the lack of trained experts and local capacity. The same is probably true of other renewable energy technologies in other countries.

Building capacity

We should not try to pick winners from amongst the renewable energy technologies, but we do need a strategy to build up capacity and disseminate proven technologies much faster than at present, to enable them to become a real option.

In Iceland, we are lucky to have abundant resources of clean and renewable energy in our powerful rivers and rich geothermal fields. We have been able to take advantage of this, so that today about two thirds of our total energy budget comes from renewable sources. This not only saves on imported fuels, but has had positive effects on the environment. The geothermal heating works in Reykjavik, the first of its kind in the world, put an end to the coal smoke over the city and boosts Reykjavik's claim to having some of the cleanest air of any urban area.

Lack of access to modern energy services is a serious obstacle to development

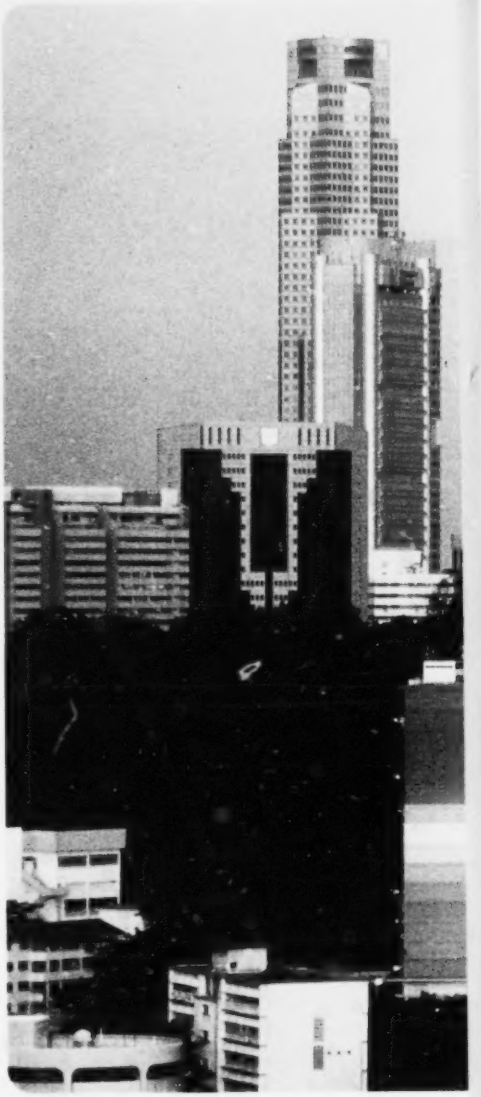
Just about all of Iceland's stationary energy is provided by renewables, but almost all the energy required for transport and the fishing fleet comes from oil. This may be starting to change. The development of cleaner fuels and more energy-efficient engines holds great promise. But policy makers must give new and promising technologies a boost. An experimental project in Iceland is examining the feasibility of using hydrogen for buses and other vehicles. Another project uses methane from a local landfill to run vehicles. Such projects may help bring the age of renewables a bit closer.

We are playing with fire as we continue to burn up the hydrocarbons stored in the Earth. We can now glimpse a future where the energy needed for our homes, industries and transport is virtually pollution free. Our task and our duty is to speed up this development ■

Siv Fridleifsdottir is Minister for the Environment, Iceland.

Commuting sustainably

Singapore manages its ever expanding land transport system in an environmentally sustainable way. **Lim Swee Say** describes how



Singapore is an island, a city state. It has a total land area of 650 square kilometres and a population of 4.1 million. With limited land and a high population density, it has to meet the challenge of building a comprehensive, efficient and yet environmentally acceptable land transport system.

We have done our utmost to minimize the adverse impacts of an ever expanding transport network. These impacts include traffic congestion, environmental pollution and the use of precious land to accommodate the growing numbers of vehicles on our roads.

Singapore has implemented various strategies to bring about a more efficient and environmentally less polluting land transport system – including improving public transport, integrating transport needs into land-use planning, managing demand for road usage and harnessing technology to optimize the capacity of the island's transport infrastructure.

Providing an attractive public transport system is a key thrust of Singapore's policies. Currently about 63 per cent of all motorized trips on our island are made by public transport – 5 million of the total 7 million made every day, comprising 3 million on buses, 1 million on the mass rapid transit trains and another 1 million in taxis.

We hope that one day 75 per cent of all motorized trips on our island will be made by public transport. To this end, we are seeking to expand our rail transit system further.

There are at present two train networks in Singapore – the mass rapid transit (MRT) lines and the light rapid transit (LRT) system. The MRT links the main population centres north-south and east-west, while the LRT serves the intra-town and localized transport needs of the residents of satellite townships. Another 57 kilometres of MRT and LRT lines will be added to the existing 91 kilometre network over the next five years. By integrating the two networks, we are making travel by train a seamless and attractive mode of transport for commuters. There are also plans to improve bus and taxi services further.

Chris Stowers/Panos Pictures

A 'traveller information system' is being introduced for the bus service. This will provide commuters with real-time information on bus movements, locations and expected arrival times, to help them plan their journeys better and cut down waiting time.

At the same time, more and more taxis in Singapore are being equipped with a satellite global positioning system, allowing them to be directed to the nearest passenger pick-up points. The system has effectively cut down customers' waiting time, while maximizing the utilization of the taxi fleet.

All these are important features in

making our public transport system attractive and appealing to commuters.

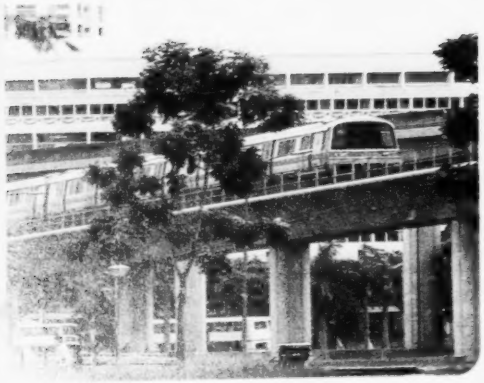
Unpopular though they may be, tough measures are also needed to moderate the ownership and use of motor vehicles in a crowded city state like Singapore. We have to avoid congested roads and motorways for both economic and environmental reasons.

Under our vehicle quota system a certificate of entitlement (COE) must be acquired before a person can register a vehicle for use on the road. The price of a COE is determined by market demand through a public tendering system, and it has a validity period of ten years. By limiting the number of COEs issued each month, the quota system has served as an effective means to keep the growth of the vehicle population in Singapore at a level of 3 per cent per year. This is a sustainable growth rate, carefully calculated and based on what we can comfortably provide for in terms of the amount of roads needed and the space to be set aside for supporting infrastructure. An electronic road pricing system is used to moderate the use of vehicles on busy roads. All vehicles in Singapore are now equipped with cashcard readers. Motorists are levied a fee whenever they pass through the gantry point of a busy road during peak hours. All transactions are done electronically, and motorists are encouraged to avoid such charges by using less busy roads, or by taking public transport. This electronic system also allows us flexibility to vary the charges based on traffic conditions, so that we can continually optimize the use of our roads.

We have also implemented an expressway monitoring and advisory system which uses detection and surveillance cameras to monitor the speed and volume of traffic on expressways. The information is, in turn, disseminated to motorists through electronic signboards placed at strategic points. This manages peak hour traffic flow by advising motorists to avoid congested expressways.

Thanks to this system, we have been able to cut down our reaction time to a traffic accident on an expressway by 7 minutes to an average of 15 minutes. This has significantly reduced the chances of traffic building up due to road accidents, and consequently reduced air pollution arising from idling and slow-moving vehicles on ▸

We hope that one day 75 per cent of all motorized trips on our island will be made by public transport



Lapham Picturepoint

Chris Stowers/Panos Pictures

expressways. By June 2001, the entire expressway network in Singapore will be equipped with the system.

Older cars are more prone to emit pollutants. We therefore decided in September 1992 to prohibit the import of any used vehicles more than three years old. This has allowed us to maintain a relatively young fleet of vehicles, which are both more roadworthy and less polluting.

Cars more than three years but less than ten years old are required to undergo a mandatory vehicle inspection for roadworthiness every 24 months; cars more than ten years old are subject to annual inspections. Goods vehicles less than ten years old are also subject to annual inspections while older ones must have them twice a year. Motorcycles and scooters also have to be inspected every year.

Our challenge is to constantly come up with new ideas... and continue our pursuit of an environmentally sustainable land transport system

Our vehicle inspection centres, which check roadworthiness, also carry out tests during these mandatory inspections to ensure that the exhaust emissions from all vehicles in use meet the limits set by the Ministry of the Environment. Vehicles that exceed these emission limits have to pass re-inspections before they are allowed back on the roads.

The Ministry of the Environment also controls air pollution from vehicle exhausts by setting stringent fuel quality and vehicular emission standards. Our strategy is to pre-empt any deterioration in air quality as vehicle numbers grow.

We first introduced unleaded petrol in 1991 and were able to completely phase out leaded petrol in Singapore by July 1998. Similarly, we have been reducing the sulphur content in diesel fuel progressively over the last decade. We have cut the permissible sulphur content in diesel to 0.05 per cent by weight, and are moving towards ultra low sulphur fuel.

Better fuel quality has, in turn, paved the way for us to adopt more stringent emission standards for motor vehicles as engine technology advances. Singapore currently adopts the Euro II emission standards for both petrol- and diesel-driven vehicles. This pre-emptive approach has helped to ensure that air quality in Singapore stays within international guidelines despite a 3 per cent rise in vehicle numbers each year.

Electric vehicles and hybrid ones (which use a combination of electric and diesel motors to deliver energy more efficiently) hold promise as the green vehicles of tomorrow, because they generate substantially lower levels of pollutants than conventional vehicles. We have introduced tax incentives to narrow the price difference between such vehicles and conventional ones and encourage their use.

The potential environmental benefits of using electric or hybrid vehicles in place of conventional vehicles are: reduced fuel consumption; reduced emission of carbon dioxide, a greenhouse gas; reduced emissions of carbon monoxide, hydrocarbons, oxides of nitrogen, sulphur dioxide and particulates; and reduced levels of noise.

From both economic and environmental standpoints, natural gas is fast becoming the most important energy resource for power generation and manufacturing in Singapore. We also want to promote its use for transport because it is a cleaner fuel. We have started a pilot project to gauge the potential of compressed natural gas buses: depending on its outcome, we hope to be able to extend the use of the fuel from buses to taxis. We hope to bring about cleaner and greener public transport.

In highly urbanized Singapore, noise pollution from road traffic and MRT/LRT trains also receives much attention. With further urbanization and the widening of expressways, noise levels have been gradually rising in some areas, especially those along existing expressways.

We require new buildings fronting expressways, major arterial roads and MRT tracks to be set back from these thoroughfares so as to minimize the impact on residents. In addition, we have set noise emission standards for vehicles, and are using low-noise porous asphalt to pave our expressways. We have adopted noise-damped rail tracks and wheels for MRT trains. Our LRT trains have rubber wheels, and we make them run on concrete tracks to keep the noise level down.

Singapore is densely populated and highly urbanized. We have to manage our land transport system effectively and creatively so that the people need not endure high environmental stress from traffic congestion and atmospheric pollution.

Over the years, by harnessing technology and planning ahead, we have been able to keep road traffic free flowing and keep our living environment clean and green. Looking ahead, our challenge is to constantly come up with new ideas, take advantage of technological advances and continue our pursuit of an environmentally sustainable land transport system ■

Lim Swee Say is Singapore's Acting Minister for the Environment and Minister of State for Communications and Information Technology.

Transported *to the future*

Curitiba has become a model for developed and developing countries alike. **Cassio Taniguchi** describes its pioneering public transport system

The value of a city is directly proportional to the degree of satisfaction of the people that live in it. So an urban administration can be visibly and critically assessed by the quality of life of the inhabitants. When it makes decisions, it should always keep its citizens in the spotlight.

For this reason, successive municipal administrations in Curitiba since the beginning of the 1970s have done their best to answer – in a practical and organized way – this basic question: how can the city welcome an ever increasing number of inhabitants into a static physical space, without losing quality of life?

Public administrators must preserve the environment while meeting the demands of an urban centre and planning the sustainable development of a city. In Curitiba, transport proved to be the key to a sustainable future. Its urban transport system was set up to give its citizens high-quality service as standard. Harmonized with the city's plans and zoning regulations, it transformed the emptiness of the 1970s into residential and business areas – and induced the desired growth.

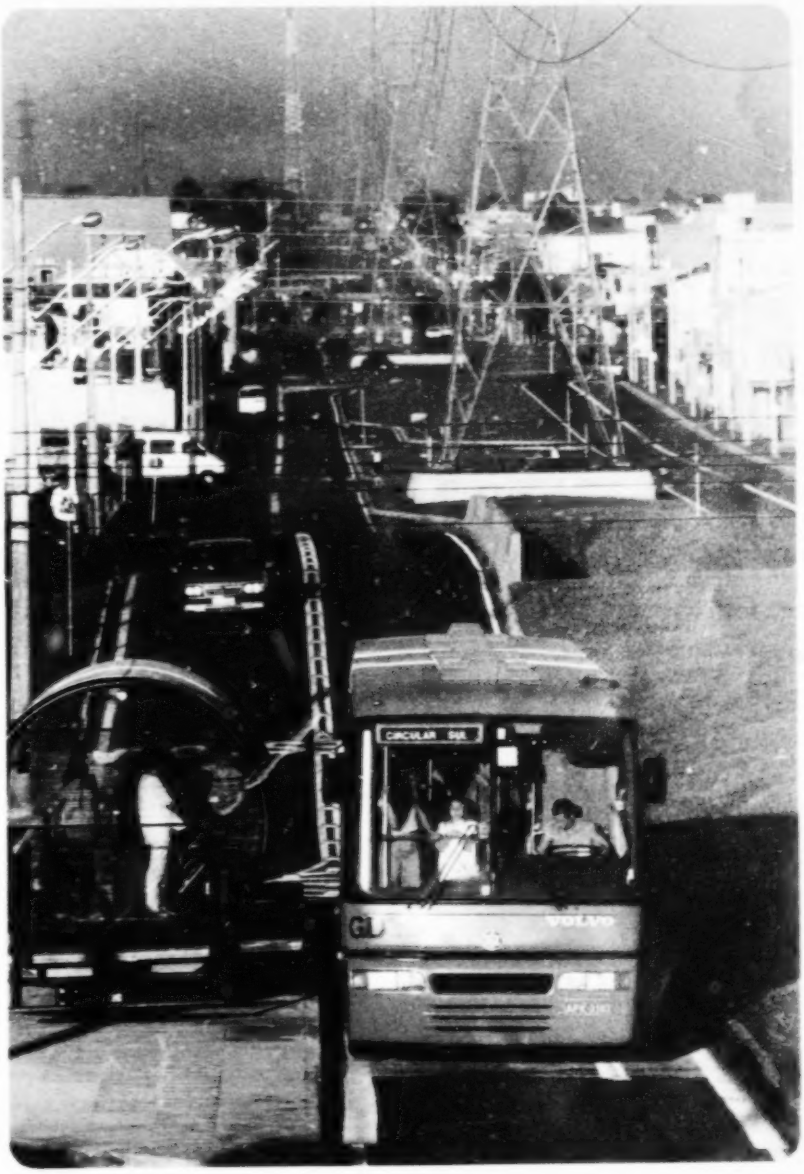
Following the principle of respecting the citizens, the Research and Urban Planning Institute of Curitiba designed special buses in 1973 in partnership with transport enterprises and automobile manufacturers. These replaced trucks adapted for mass transportation which did not offer the comfort or safety their users deserved. The new buses had larger doorways, a lowered chassis, wide windows, special ventilation systems and rear-located engines, all to provide passengers with greater comfort.

The city's mass transportation system, which was established in the following year, was the first in Brazil to use bus lanes alongside the system for private cars. People left their cars at home, finding mass transportation very competitive because of its speed, punctuality and regularity.

As the system evolved, larger buses were designed and built – including articulated ones in the 1980s, carrying up to 160 people, and bi-articulated ones in the 1990s each with a capacity of 270 passengers. Vehicles with automatic transmissions and air suspension were introduced, as was a system of paying fares in advance so as to make boarding more efficient.

Two million people now use the city's integrated transit network every day. It has four elements: the direct ▸

At City Hall, we work to enable the inhabitants of Curitiba to participate in all decision-making processes



line; an alternative 'speedy' system – buses which travel faster and have fewer stops; the inter-district line, which carries out trips between districts without crossing the centre of the city; and feeder buses, which connect terminals to the districts. It is integrated within the 12 municipalities of the metropolitan region, and is continually updated as the city and its population grow.

Public transportation also plays a fundamental role in preserving the environment. A high-quality transport system, accessible to the citizens, reduces the number of vehicles circulating around the city and, as a result, cuts the level of air pollution.

Taking the lead

Curitiba took a pioneering step to improve air quality even further by becoming the first city in Brazil to use less polluting fuels. We have adopted a special fuel made up of 89.4 per cent diesel, 8 per cent anhydrous alcohol and 2.6 per cent soybean additive. The resulting fuel is less polluting and cuts the emissions of particles to the air by up to 43 per cent. Adding the mixture of alcohol and soybean additive to the diesel also brings social and economic benefits, including maintaining employment in rural areas, as every billion litres of alcohol generate approximately 50,000 new jobs.

Curitiba is now issuing a smart card to replace cash in paying fares, thereby increase the security for passengers using the mass transportation system. Citizens registered at the City Hall will be given access to the card, which is made up of available credits. People who are exempt from paying fares – such as the elderly, physically handicapped, police officers and students – will also have the right to a card.

At City Hall, we work to enable the inhabitants of Curitiba to participate in all decision-making processes, so they can see the city as an extension of their own homes. We do not intend to leave icons or concrete memorials as legacies, but social action revives a feeling of citizenship and bring benefits to all without distinction ■

Cassio Taniguchi is Mayor of Curitiba.

BUCKING THE TREND

Freiburg's green transport policies are central to the city's development, reports **Rolf Böhme**

For over three decades, the city of Freiburg im Breisgau – the regional capital of one of Germany's most popular tourist destinations and one of the country's fastest growing major cities – has pursued an environmentally friendly urban development policy in which transport plays an important role.

The 'global transport concept' – with a transport infrastructure that is friendly to people, the environment and the city – is intended as an integral part of the development of the city, which now has 202,000 inhabitants. It includes reinforcing the city as regional capital, developing a 'quickest route to the city' campaign, preserving cityscape and urban spaces, and reducing pollution.

The concept was approved in 1969 and, since then, the city has developed many pioneering plans and measures, including establishing cycle lanes, banning traffic from the city centre, introducing Germany's first transferable flat-rate travel card, and building a city and suburban railway (see box). Its objectives are:

- *To reduce traffic in the city and give priority to local public transport, cyclists and pedestrians.*
- *To create a rational balance between all modes of transport.*
- *To create global traffic calming and concentrate private vehicles onto well constructed main arteries.*
- *To control parking in public places.*

Comparing figures for 1982 and 1999 for the three modes of transport – motor vehicles, local public transport and bicycles – clearly shows the positive effects of the concept. Local public transport increased from 11 to

Stuart Cohen/The Image Works/Topham

18 per cent, and bicycle use from 15 to 26 per cent, while motor vehicle traffic decreased from 38 to 32 per cent, despite the increase in the issue of motor vehicle licences. This result is in complete contrast to the trends observed in practically all other Central European cities.

The cornerstones of the transport concept are:

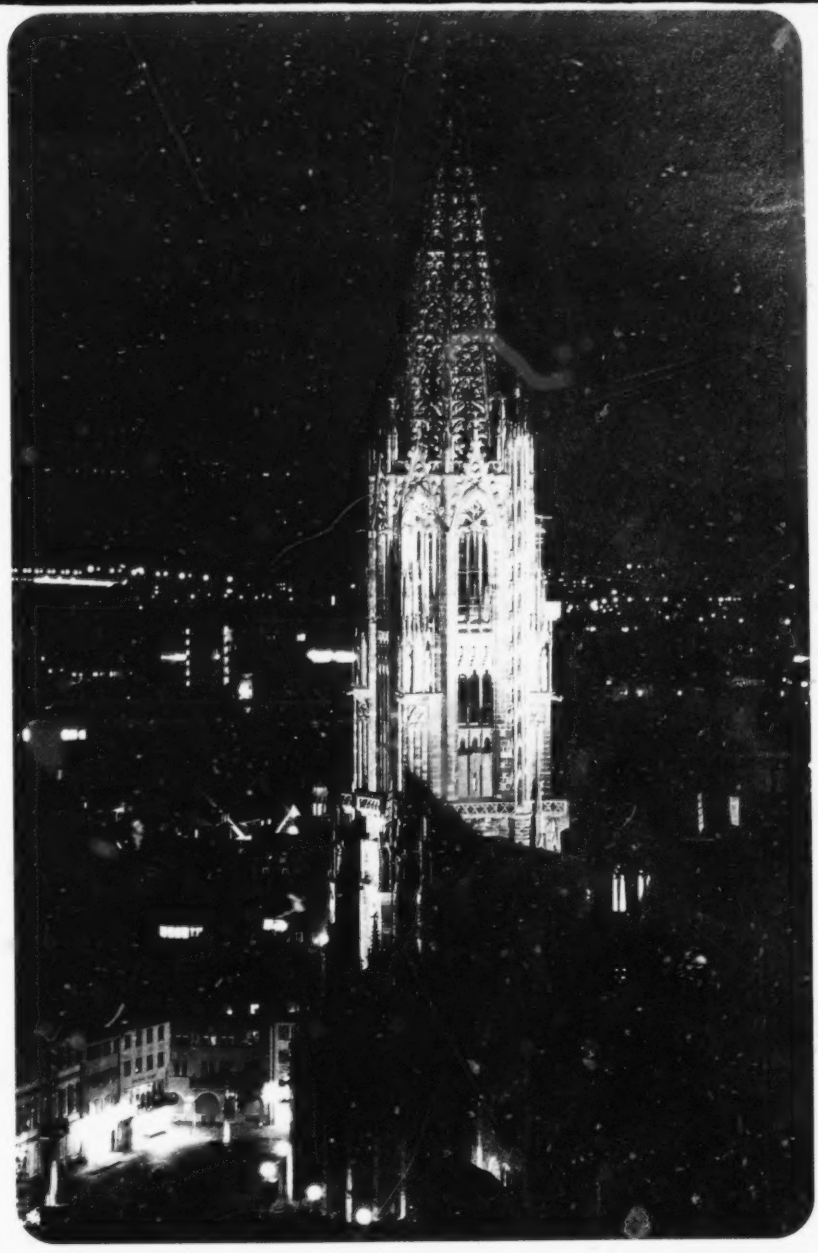
1. *Traffic calming.* The first important and far-reaching step in Freiberg's environment-friendly transport policy was transforming the city centre into a pedestrian zone in 1973. After several years of preparation, the city centre was closed to all motorized vehicles. The provision of public transport was optimized, with tram routes running north-south and east-west through the city centre.

Planners of public spaces calmed traffic further by using the natural stone surfaces traditional to Freiburg, the classic Rhine pebble pavements and, above all, the city's historic Bächle (gullies) in designing roads. Similar measures were gradually introduced in the districts around the centre. Then, in 1990, a 30 kilometre per hour speed limit was introduced to all residential areas, except those on main roads, which now covers the neighbourhoods where 90 per cent of residents live.

2. *Concentrating traffic and improving roads.* Bundelungsstrassen (roads on which traffic can be concentrated) are still needed, even after restrictive traffic calming and traffic avoidance measures, improvements in local public transport and encouragement of cycle use. Meanwhile, creating new routes makes it possible to improve inner city street networks.

One example is the rerouting of Trunk Road 31 through the eastern end of the city, due for completion this year. The politically controversial road was routed via two underpasses beneath the eastern part of the city,

The global transport concept is intended as an integral part of the development of the city



German National Tourist Office

without any detrimental effects. This provided the opportunity to put in place road improvements and traffic calming measures meeting the objectives of sustainable urban development, within the framework of a local urban development scheme for Freiburg East. Continuing the route westwards through the projected city tunnel will divert traffic away from the city's centre and from one of the its most striking locations, the bank of the River Dreisam.

3. *Managing public highways and adjacent land.* Public highways and adjacent land in the city centre and the surrounding area are controlled and there are paying car parks. Controlling parking is a key feature of the transport policy, so there is no free, uncontrolled parking in the city centre or the immediate area. Parking is subject to a sliding scale of charges and regulations, from the city centre outwards to encourage commuters to park-and-ride on public transport.

4. *Public transport.* The city promotes the use of public transport, especially trams, which are the classic means of transport in cities the size of Freiburg. The city council decided to preserve the tram network in 1972 and three new routes have come into operation in recent years. ▸

Of course, this means that vehicles and timetables must be made attractive to passengers. A regional environmental card (travel card) has been introduced at a standard rate of DM71 per month (approximately $35), valid both for the city and the two neighbouring districts. There has been a very positive response and the number of passengers has increased by more than 100 per cent since 1980.

It is vital for the future to link the city and the region as a whole. The city has set up a special unit with the two neighbouring districts to develop an integrated regional transport concept, in collaboration with the Breisgau S-Bahn (city and suburban railway) 2005. Plans provide for the integration of Deutsche Bahn's rail network, the tram network, and both city and regional buses into a unified system. The cost of implementing this over some ten years will be around DM800 million (approximately $400 million). The Breisgau S-Bahn 2005 will form the backbone of a regional development programme. The public transport policy already implemented in the city is thus being logically extended to the region.

5. *Bicycle use.* In Freiburg the bicycle is an essential mode of transport for short and medium distance journeys. At relatively small expense, people can be encouraged to cycle – through promoting bicycle use for the benefit of the environment in a targeted way.

A cycle lane plan was first drawn up in 1970. Then there were only 29 kilometres of cycle lanes, which were not interconnected. Now there are more than 500 kilometres of interconnecting lanes. There are some 5,000 parking spaces for bicycles in the city centre, with more at tram stops – for bike-and-ride. There is one for 1,000 bicycles, with a range of other cyclists' facilities, at the main railway station – the most important hub for local and long-distance public transport – built at a cost of DM4.5 million ($2.25 million).

Freiburg is conscious of its historic role and seeks to maintain and reinforce its position as a socially diverse and commercially important social, cultural and economic centre. So it is essential not to allow avoidable traffic to build up and to promote environment-friendly practices, while allowing for necessary and unavoidable commercial traffic and managing it in a city-friendly manner. Furthermore, the urban solutions must in future be extended to the whole region, so that boundaries between city and countryside are no longer important ■

Dr. Rolf Böhme is Mayor of Freiburg im Breisgau.

Freiburg's milestones

1969 Approval of the global transport concept

1970 Initial plan for cycle lanes

1972 Decision to maintain and improve tram network

1973 Total ban on traffic throughout the city centre to create a pedestrian zone

1979 Global transport plan giving equal importance to all modes of travel: walking, cycling, public transport and private motor vehicles

1985 Introduction of Germany's first transferable flat-rate city travel card

1989 Approval of integrated transport concept aimed at reducing traffic and promoting sustainable environment-friendly transport

1990 Introduction of 30km/h zones throughout the city

1991 Introduction of the Regio-Umwelt-Karte (regional environmental card), a flat-rate travel card for use on public transport, valid in the city and two surrounding districts (now known as regioncards)

1997 Building of the Breisgau S-Bahn (city and suburban railway) 2005 begins

World Environment Day

Message from the Secretary-General, Kofi A. Annan

The theme of this year's observance of World Environment Day is 'Connect with the World Wide Web of Life', a choice that reflects the need for each and every one of us to recognize our role in preserving our fragile planet and the ecosystems, resources and natural processes that bind us all together. More than ever, life on Earth requires of us a sense of universal responsibility – nation to nation, person to person, human to all other forms of life.

Albert Einstein once said that in crisis, imagination is better than knowledge. We do need more knowledge about the world's major ecosystems and about the complex interplay between environment and development, since it is impossible to devise effective policy unless it is based on sound scientific information. That is one reason why today marks the launch, by the United Nations and the World Resources Institute, of the Millennium Ecosystem Assessment, an international collaborative effort to fill important knowledge gaps and to map the health of our planet.

At the same time, we know more than enough already to face the hard choices ahead. We already have the technical skills to halt destructive trends and to place our economies on a more sustainable footing. It is not knowledge and scientific research, but political and economic factors, that will determine whether or not the wisdom accumulating in our laboratories and libraries will be put into practice. Challenges such as climate change, desertification, the destruction of biological diversity and population growth are testing not only our imagination, but also our will.

Sustainability is in everybody's interest, rich and poor alike. One in every two jobs worldwide – in agriculture, forestry and fisheries – depends directly on the sustainability of ecosystems. Yet unsustainable practices are woven deeply into the fabric of modern life. And myths have taken hold suggesting there is little alternative to these short-sighted and wasteful patterns of consumption and development. So let us, on this World Environment Day, connect with a new ethic of global stewardship and conservation, and most of all with the imagination and courage to make it a reality ■

Message from Cuba

Rosa Elena Simeón Negrin

Cuba's designation by UNEP as one of the two venues for the international celebrations of this year's World Environment Day has been welcomed with great enthusiasm and a high sense of commitment by our country. We appreciate that this decision is a recognition of the efforts of the Cuban people and Government – and of all organizations and companies in the country – in the serious and determined pursuit of sustainable development.

In Cuba we have celebrated World Environment Day on 5 June since 1979 and, since 1996, a friendly rivalry has grown up among the country's 14 provinces to achieve the best results in implementing their environmental strategies. Institutions, companies, communities and civil society in general are all actively involved in this competition, headed by local government bodies. This year we salute World

Continued on page 18

Message from Turin

Mercedes Bresso and Giuseppe Gamba

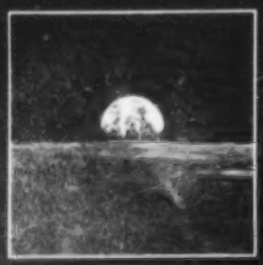
The Province of Turin has been celebrating World Environment Day since 1997 and all the social actors committed to environmental issues look forward to 5 June of this year.

From the first, the day has been seen as an opportunity to present the province's achievements in sustainable development, and to give it credit for working out new strategies.

Among the province's many environmental policies is strategic planning for sustainable development through a local Agenda 21: this programme is now half-completed and

Continued on page 18

Earthrise



Photographs play a key role in communicating environmental issues. Environmental photographers try to take pictures that get inside people's heads and stay there. Consciously or unconsciously one is trying to make photographs that resemble the mental images from which all of us make our personal histories. None of us accurately remembers the continuity of our lives; we remember edited moments in the form of images that look very like photographs. When people think about a photograph, it comes up in their mind's eye like a personal memory. This gives photography a peculiar psychological force.

Seeing the Amazon burning or hungry children in a slum changes one forever. Haunting and difficult as these experiences are, photographers are strangely privileged to learn about the world directly. The pictures I take are driven by an overwhelming sense of urgency to convey these experiences, relatively directly, to anyone who will pay a moment's attention.

It is exactly 09.32 hours on 20 July 1969. Inside the Command Module Columbia on Apollo II's mission to the moon, Armstrong, Aldrin and Collins look through the observation window and see the Earth as it appears to rise above the rim of the moon. It is not recorded who picked up the on-board Hasselblad camera and took the most famous and arguably the most significant series of photographs of all time. Almost everyone who has lived since that moment has shared the view of the Earth from space.

The images are beautiful and their effect was, and is, overwhelming. The conspicuous contrast between our living planet and its lifeless moon is buried deep in our collective consciousness.

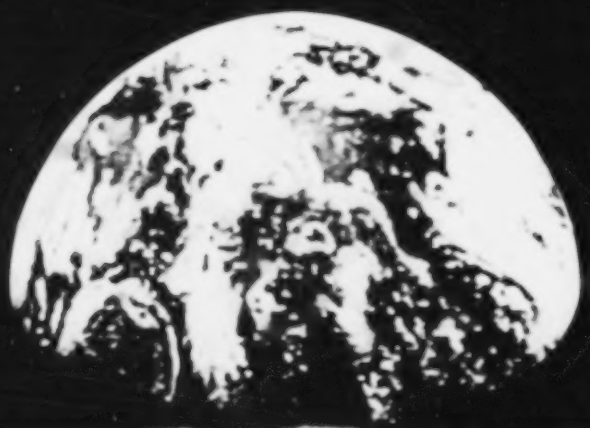
Earthrise showed us just how fragile and isolated our situation is. It marked the beginning of the contemporary environmental movement. We now know that the 'giant step for mankind' that lies ahead of us is regaining nature's cyclical pattern, where every piece of waste we produce is the beginning of new growth.

'A Hard Rain's A-Gonna Fall'

At the time of the moon landing, I was lost on the southern edge of the Sahara Desert. A Tuareg nomad rescued me and took me to his companions. He went into his hut and reappeared with two pieces of wood, a rolled umbrella and a cassette player. He rubbed the sticks together and made a fire. We had a nice cup of tea. He warmed the batteries, turned on the cassette player and played Bob Dylan's song 'A Hard Rain's A-Gonna Fall'. The effect was extraordinary.

Dylan wrote the song in 1963, when the world seemed on the brink of nuclear wipe-out. Yet by 1969 we had begun to realize that it was not just war that could bring about our extinction. The way we live our lives makes us dangerous passengers on this beautiful planet.

The pictures opposite are a selection from my slide show, *Hard Rain*, which seeks to illustrate this message ■



NASA/Still Pictures

From **A Hard Rain's A-Gonna Fall**

Oh, what'll you do now,
my blue-eyed son?

Oh, what'll you do now,
my darling young one?

1. *I'm a-goin' back out 'fore the rain starts a-fallin',*

2. *I'll walk to the depths of the deepest black forest,*

3. *Where the people are many and their hands are all empty,*

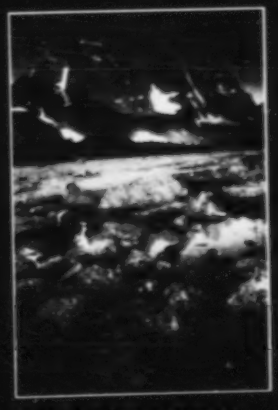
4. *Where the pellets of poison are flooding their waters,*

5. *Where the home in the valley meets the damp dirty prison,*

6. *Where the executioner's face is always well hidden,*

7. *Where hunger is ugly, where souls are forgotten,*

8. *Where black is the color, where none is the number.*
And I'll tell it and think it and speak it and breathe it,



9. *And reflect it from the mountain so all souls can see it,*

10. *Then I'll stand on the ocean until I start sinkin'*
But I'll know my song well before I start singin',

11. *And it's a hard, it's a hard, it's a hard, it's a hard,*
It's a hard rain's a-gonna fall.

Mark Edwards is an environmental photographer.

All images from the Hard Rain *slide show are by Mark Edwards/Still Pictures except: 8- Vincent Decorde/Still Pictures; 9- UNEP/Still Pictures; 10- Galen Rowell/Still Pictures.*

Message from Cuba continued from page 15

Environment Day with over 60 national actions and 740 local activities, some of which were set in motion as long ago as January.

Cuba's most important resource is its people and the promotion of their intelligence: their development has enabled us to achieve positive indicators of environmental sustainability and quality of life and encourages us to continue fighting for their further improvement. We are progressing appreciably in promoting health, education, sports, culture and an equitable distribution of wealth. We are successfully fighting to preserve our natural resources and to enhance our environmental culture by improving our social and institutional capacity to face environmental challenges.

Cuba is conserving its biodiversity through the national system of protected areas; we are developing sustainable agriculture and integrated watershed management; we are promoting renewable energy sources; and we are developing cleaner production, the recovery of raw materials and the lowering of ecological vulnerability by reducing pollution. We have increased our sanitation and drinking water coverage so that it now reaches almost our entire population, both urban and rural. We halted our forest loss 35 years ago, and now forests cover 21.1 per cent of the country. And we are enforcing all the commitments we have made through various multilateral environmental agreements. Yet we believe that we can and must achieve much more.

In spite of being subjected to an economic, commercial and financial blockade, we share our modest resources with other peoples, promoting international cooperation between developing countries, and providing free training to the doctors and sports teachers of the future, among other specialized professions.

We have a permanent policy of opportunities for exchange of experiences, through multiple national and international events, thus contributing to the discussion and evolution of issues related to sustainable development.

The celebration of World Environment Day in Cuba is a catalytic event. It will contribute to consolidating our environmental policy and management, and to increasing public awareness to promote integrated action among every element of our society so as to achieve ever higher targets in our goal of sustainable development ■

Dr. Rosa Elena Simeón Negrín is Minister for Science, Technology and Environment of Cuba.

Message from Turin continued from page 15

has already fostered many projects and interventions. World Environment Day has been very important for the province in this process. Through it, Turin has become aware of the role played by several active stakeholders, and this has strengthened its will to succeed with the environmental policies they share. Such an approach is the basic principle of Agenda 21.

Particular attention has been given to developing renewable sources of energy and biomass, and to rationalizing the use of hydroelectric sources. Other priorities include implementing new systems for the integrated management of water, aimed at eco-efficiency; a waste disposal programme which aims to recycle 50 per cent of the wastes produced and recover energy from the rest; and shared decision-making on the siting of waste disposal plants.

Emphasis has been given to landscape preservation through a network of provincial parks, and to environmental education through the creation of territorial laboratories.

For years the province has promoted sustainable transport. This is achieving tangible results through the creation of an underground system for Turin and its metropolitan area, the Turin railway axis, inter-exchange areas and other projects that combine to create a coordinated transport system for the wider metropolitan area.

UNEP's proposal that the Province of Turin should host the celebrations for World Environment Day, involving representatives from different continents, is the natural consequence of the role that the province has assumed for years in creating a lasting network between similar local and foreign communities. At a national level, the province's commitment over the years has merited the presidency of the body coordinating Italian local authorities involved in achieving local Agenda 21s.

The overall aim is to construct a new world entity representing local authorities at the United Nations and the European Union, which could create partnerships for cooperation and development between regions from North and South ■

Professor Mercedes Bresso is President of the Province of Turin. Giuseppe Gamba is Vice President in charge of sustainable development policies, Province of Turin.

WIN UNEP-WCMC's World Atlas of Coral Reefs

Answer three questions (you can find them on page 15 of this issue of *Our Planet*) and tell us in not more than 15 words how each of us can connect to the world wide web of life.

1. On what day is World Environment Day celebrated each year? _____

2. Which two places will host the international celebrations for World Environment Day 2001 _____

3. What is the slogan for World Environment Day 2001? _____

'I believe that each of us can connect to the world wide web of life by _____

My name _____

Address _____

Entries must be received by SMI, PO Box 119, Pin Green, Stevenage, Hertfordshire SG1 4TP, UK, or corals@ourplanet.com no later than **20 September 2001**.

One first prize of the **NEW UNEP World Conservation Monitoring Centre's *World Atlas of Coral Reefs***, donated by the University of California Press and UNEP-WCMC. **Three** runners up will each receive a copy of ***Earth and Faith*** published by UNEP.

The winner and runners up will be chosen by a panel consisting of UNEP's Executive Director, its Director of Information, and the Editor of *Our Planet* from the entries received. The decision of the judges is final. This competition is closed to all those working for UNEP, UNEP-WCMC, Banson, KPC Group, SMI, University of California Press, and all other companies and organizations associated with the production of *Our Planet* magazine and their families. A full set of rules is available on application from corals@ourplanet.com

Paul Smith/Panos Pictures

Breaking **free**

JORMA OLLILA outlines the environmental opportunities in connecting people through mobile technology

Topham Picturepoint

Hartmut Schwarzbach/Still Pictures

The future is arriving fast. New communications technologies are evolving around us and the power of mobility is transforming lives. As we move forward, the borders between telecommunications and information technology will become increasingly blurred. Nokia's future handsets, for example, will not be mobile phones, they will be more like personal trusted devices with multiple applications, combining our keys, credit cards, passport and complete communicator needs.

There is no doubt that the advent of these kinds of high speed products and services will minimize our dependency on time and place as we each develop our own virtual identities in the digital space. In short, we are living in a world where the virtual is becoming the actual.

But technology as such will not decide the course of development. Much will depend on individual lifestyle choices. How will we use the new freedom that advanced technology brings? Will we achieve energy and resource savings in one area, then squander them through other means – borrowing from Peter to pay Paul?

The major environmental opportunities presented by the mobile information age stem from two phenomena which environmentalists have called 'dematerialization of production' and 'immaterialization of consumption'.

'Dematerialization' refers to the decline over time in the energy use and weight of materials in industrial products. In our business, the trend towards weightlessness is manifest in the shift away from building fixed-line phone networks and in the ever smaller and lighter base stations and phones that Nokia produces. One of our early mobile phone models from the beginning of the 1980s, for example, was so heavy and clunky that one needed a car to take it around. The phone I now use weighs less than 100 grams and fits comfortably in my pocket.

Thanks to information technology, dematerialization is also occurring in the amount of physical resources used in product manufacture. Production processes and material streams are being better controlled, enabling the increased use of process by-products. Even at the level of logistics, better control and greater gains are possible if production and distribution is done in an electronic environment.

'Immaterialization of consumption' on the other hand refers to replacing material goods with 'immaterial' services. Our family no longer uses an answering machine at home, as we each have our own personalized service provided through our mobile phones. In the future, we will no longer buy CDs or rent videos, we will be able to purchase the rights to various entertainments through electronic means. A visit to a bank will be replaced by on-line financial services, a simple postcard will be substituted by real-time multimedia messaging, and more and more hardware will become software. Essentially, we will be paying for the experience in future, not the product.

Unexpected outcomes

But, like everything else, this shift brings some environmental uncertainties. One such is the rebound effect which actually increases the overall scale of production and consumption, so that the net environmental effect comes out negative. An example of this is the much-touted move towards an electronic paperless world, which has in fact seen total paper consumption soar. Similarly no communications technology has so far actually resulted ▸

in a net reduction in transport and travel: rather than being set free from travel, people are, ironically, made free to travel more.

We need to ask ourselves how the resources, time and money saved from advanced telecom services should be used. If we have more free time, will we increase our consumption and travel more? It will be up to us whether we act in sustainable or unsustainable ways. This is not, of course, to ignore the fact that many people in the world still wake up in the morning with no choices, aside from finding ways to stay alive.

Isolated issue

In the past, big businesses typically treated the environment as an isolated issue assigned to a division of experts who were then duly exiled to remote corners of the firm. They also saw pollution and waste issues as a matter of just doing the minimum to keep the authorities at bay.

Environmental work today is driven by a range of new stakeholders. Trade customers looking downstream to their product users put pressure on manufacturers to operate in environmentally responsible ways, while government legislators create laws to allay the effects of industry on the environment.

Then there are the high-profile non-governmental organizations who help keep corporations on their toes in the public arena, and the growing number of green funds that now include ecological issues in their investment criteria.

Spurred by these new incentives and a greater understanding of the possibilities involved, concern for the environment has now become fully present in the mainstream policies of most industry players. Big corporations are no longer satisfied with simply not being the bad guy. They understand the larger responsibility attached to environmental awareness and are demanding more from themselves. They are even looking for ways to make a difference through leadership.

The transformation of the corporate giant from despot to deliverer is one thing. But I would come back to the role of the individual and personal accountability. The situation has become steadily more complex. There are no longer clear villains and victims. There is not even a clear distinction between producer and customer, particularly with the explosion of on-line communications.

Customers, or so-called 'prosumers', provide information on what they want – and goods are produced accordingly. On-line bookstores let customers recommend and write reviews. And, if a customer discovers a flaw in a product and does not get an appropriate response from the manufacturer, the next course of action is to go on-line and effectively tell the world. Selling satisfaction, not just products, has now become the key.

But how does this relate to sustainability? In this consumer-driven market companies cannot afford to ignore the central issues, like concern for the environment, that guide people's thinking. We need an ongoing open dialogue and the opportunity to learn from each other.

Learning curve

Alvin Toffler, the futurist, said a few years ago that 'the illiterate of the future will not be the person who cannot read. It will be the person who does not know how to learn'.

There are still many unknowns, but it is important to acknowledge that we are all on the learning curve together. Technology as such does not decide the course of the future, but it does empower us to facilitate change. I imagine a world where we include sustainable development in all our personal decisions and where we no longer passively distance ourselves from our decisions and our actions. In the end, what we do is all the world has left ■

I imagine a world where we include sustainable development in all our personal decisions...

Jorma Ollila is Chairman and CEO of Nokia.

Calling **for change**

BRAD ALLENBY outlines the environmental challenges of the 'information revolution'

Superficially the relationship between telecommunications and the environment seems to be relatively straightforward: minimize the impacts of telecom devices and infrastructure, maximize the substitution of information for other inputs into the economy (for example, through teleworking), and you have a recipe for sustainability.

This is true as far as it goes – but it is also a gross oversimplification. Information changes the world. It is autocatalysing – the more you have, the more you generate – and it is impossible from this vantage point to predict the results of what some call the 'information revolution', others the 'knowledge society'. All that can be done is to sketch out a schematic conceptual framework within which we may at least begin to ask the right questions.

The most basic level is manufacture of telecom devices – making switches, routers, cell phones, television sets, personal computers. This is the traditional focus of environmental professionals, and is fairly well understood, although implementing appropriate standards, especially in some developing countries, requires continued attention.

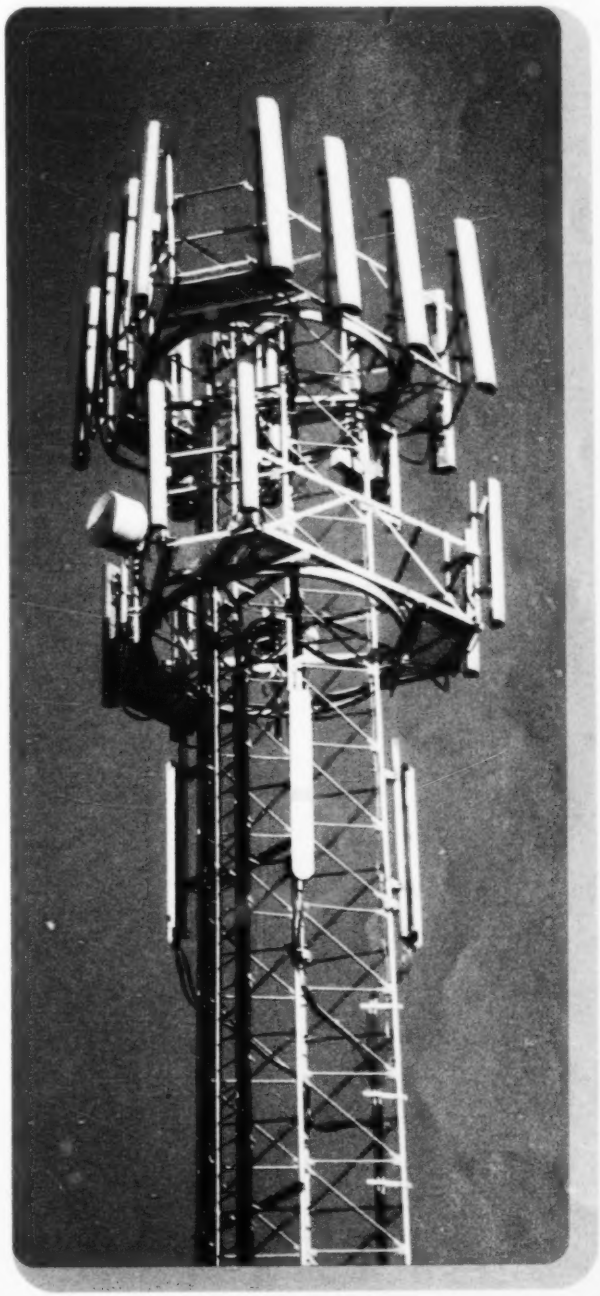
Life cycles

The next level is considering the whole life cycle of the device, attempting to understand its impact on the environment while it is being used and when it reaches the end of its life. The methodologies for understanding complex manufactured objects over their life cycle and designing them appropriately (design for environment) are still primitive. But this level is at least recognized conceptually, and is being addressed, especially in Europe.

The third level involves the construction and maintenance of networks and infrastructure. Here the issues become broader, including everything from constructing land-line facilities properly through environmentally sensitive wetlands and habitats, to the overall energy efficiency of network operations, to the maintenance of the fleets of vehicles needed to keep the network running well. In some cases, including network energy efficiency, economics drives appropriate behaviour; in others, such as land use or vehicle emission systems, regulations control environmental impacts. It is probably fair to say that this level is also reasonably well understood and managed from an environmental perspective, although the dynamics can be tricky because networks are complex systems.

More importantly, perhaps, social issues arise for the first time: one may argue that, where the coverage of networks is not universal, differential access to information and knowledge may develop between, for example, rich and poor in the 'digital divide'. Such social issues must be addressed, although the appropriate division of labour among governments, private firms and non-governmental organizations has yet to be stabilized.

Our degree of knowledge is relatively low, however, about the fourth level – services such as broadband communications, and social practices based on them, such as teleworking. Teleworking provides a good example. Although the practice has been around for decades, critically important questions remain unresolved: for example, how do ▶



its environmental and social implications differ among cultures and/or what are its long-term demographic and distributional effects?

We are almost completely at sea when it comes to more complex information systems. For example, the Internet – and services built on it, such as e-commerce – is rapidly evolving, and having significant impacts across economic, cultural and social systems. But asking the question, 'What are the life cycle environmental and social impacts of the Internet?' illustrates how little we know. Partly this is because we lack data and research, but more fundamentally it is the result of the profound cultural power of information systems at this scale.

Finally, there is the fifth level – the knowledge economy and the infosphere. One example may illustrate the potential for discontinuous and fundamental change in Earth systems – both natural and human – implicit in information technology. What are the implications of a completely sensored and

Information changes the world... the more you have the more you generate

wired world, one where millimetre size cubes scattered around the Earth are knit into a real time information structure that tracks the evolution of environmental systems as it happens? This is not science fiction: as I write the Lawrence Livermore National Laboratory and the University of California are planning just such an information network for the entire Central Valley of California. Psychologically and operationally, this would be a very different world. Just the possibility illustrates the promise and challenge of the operation of information systems and the environment at this scale, and our relative lack of knowledge about it ■

Brad Allenby is Environment, Health and Safety Vice President for AT&T, an adjunct professor at Columbia University, and a Batten Fellow at the University of Virginia's Darden Business School, United States.

(The opinions in this article are the author's alone, and not necessarily those of any of the entities with which he is associated.)

GLOBAL ICT INITIATIVE

Working with UNEP, the International Telecommunications Union, the European Telecommunication Network Operators Association, the North American Communications Environmental Excellence Initiative and signatories of the World Telecom Congress communiqué on sustainable development, a number of companies have come together to establish a global ICT sustainability initiative. It will be launched on 5 June at the World Environment Day celebrations in Turin.

Recognizing the revolutionary changes taking place around the world as a result of new information and communication technologies (ICT), members of the initiative will take a pro-active stance over their environmental impacts and the contribution their technologies can make to sustainable development. The specific objectives are to:

1. Create a global forum to improve and promote both products and services, and access to ICT, for the benefit of human development and a more sustainable environment.
2. Promote greater awareness, accountability and transparency within the ICT sector.
3. Encourage continual improvement in environmental management and develop best practice.
4. Stimulate international and multi-stakeholder cooperation with, and by, the ICT sector.
5. Promote and support partner regional initiatives and liaise with other relevant international activities.
6. Start with a greater emphasis on environmental issues and move towards a gradual adoption of the full corporate social responsibility agenda.
7. Extend membership of the initiative in order to achieve full global coverage.
8. Construct the ICT industry contribution to the Rio+10 summit and other global activities such as the Global Reporting Initiative and the United Nations Global Compact.

The initiative is open to both communication service operators and their equipment suppliers and member companies who commit to a certain level of environmental achievement.

At the time of writing, the following companies had put themselves forward as founding members: AT&T, British Telecom, Cable and Wireless, Deutsche Telekom, Ericsson, Lucent Technologies, Marconi, Telcordia Technologies and Telenor.

Chris Tuppen, Head of Sustainable Development and Corporate Accountability at British Telecom.

For more information contact UNEP–DTIE, tel: +33 1 44 37 14 50, e-mail: unep.tie@unep.fr

Reaching the UNREACHED

M. S. SWAMINATHAN shows how Gandhi's concept of *antyodaya* provides the most effective way of bridging the modern digital divide

The new century and millennium have opened with the world experiencing serious divides – demographic, economic, gender, genetic and digital.

During the last 12 months, reports on the ever widening rich-poor divide have been published by the World Bank, the United Nations Development Programme and the International Fund for Agricultural Development. While the rich countries, and the rich in all nations, are benefiting economically and socially from the 'new economy' based on technology, knowledge, information and innovation, the poor nations and the poor in all countries are being further marginalized in their economic status and standard of life.

Globalization without ethics – or equity in sharing the benefits of the digital and other technological revolutions – will only enhance joblessness and social disruption. The loss of rural livelihoods, resulting from both environmental degradation and the lack of competitive ability in markets, is leading to the rapid expansion of urban slums in many developing countries. The 1996 Habitat II Conference in Istanbul, whose follow-up meeting is held this summer, rightly recommended steps to halt the influx of such environmental and economic refugees into towns and cities.

A growing gap

The 1972 Stockholm Conference highlighted the relationship between poverty and environmental degradation. Despite increased awareness, the rich-poor divide in economic well-being is growing. Since Europe's industrial revolution, technology has been an important factor in this economic divide. The challenge now lies in enlisting technology as an ally in the movement for gender and social equity and for fostering harmony within humankind and between it and nature. The digital revolution provides an opportunity to do this.

The most effective pathway by which technological and information empowerment can reach the unreached, is the one Mahatma Gandhi described over 60 years ago as 'attention to the poorest person'. He wanted all those involved in formulating developmental policies and strategies to adopt a bottom-up approach. He said that *antyodaya* will help to promote a *sarvodaya* society, characterized by high social synergy, where one individual's economic advancement is not at the cost of another's opportunity. A *sarvodaya* society provides a win-win situation for everyone and paves the way for a sustainable future for humankind.

How then can we foster an *antyodaya* pathway to bridging the digital divide? Computer-aided and Internet-connected knowledge centres were started in rural Pondicherry in South India three years ago to work out a methodology for this purpose. These are owned and controlled by the village people that use them and provide the ▸

Hari Mohdhari Dwivedi Typhoon

Dimdhal Typhoon

information they demand. Since there is no telephone connection in some villages, both wired and wireless systems of communication were established. And as electricity supplies are erratic, an integrated thermal and solar energy supply system has been used to ensure uninterrupted power to run the computers.

The knowledge centres are based on the principle of inclusiveness: all members of the rural population derive benefit from them, regardless of age, gender or social status. Invariably, the villagers chose four women to operate each centre, each spending about two or three hours a day there.

The challenge now lies in enlisting technology as an ally in the movement for gender and social equity

Experience has shown that such women volunteers, whether literate or semi-literate, take to new technologies like fish to water, provided the training methodology is learning-by-doing.

The knowledge centres have effectively empowered rural communities with information on the environment, health, sustainable agriculture and aquaculture, meteorology, markets and prices. Much emphasis is placed on the numbers of humans and animals that ecosystems can support, with particular reference to land and water resources. Rural families give priority to information on health, livelihoods, weather and markets. Generic information is converted into information specific to each location, thus enhancing its practical relevance.

For example, each evening in a coastal village inhabited by fisher families, the women download information on the likely wave heights in the sea nearby. This information, available on the website of the US Naval Oceanographic Office, is then broadcast throughout the village by loudspeakers. The fishermen thus get accurate information on sea conditions before they set out in their wooden boats. The ability to provide this kind of life-saving information at the right time and place has generated a hunger for knowledge and a great faith in new technologies among the rural poor. Virtual colleges linking poor rural people with scientists and technologists can help to convert Gandhi's vision into reality.

Bridging divides

Evaluating the experience gained from the rural knowledge centre pilot project has shown that bridging the digital divide also helps to bridge the gender one, by increasing the self-esteem and self-confidence of socially and economically underprivileged women. Including the excluded in the empowerment brought by knowledge and skills is one of the important benefits of an *antyodaya* approach to harnessing new technologies for public good.

Ultimately, the computer-aided and Internet-connected rural knowledge centres will be linked to a community radio network, to ensure that information and knowledge relevant to local needs and livelihoods reach the unreached. The knowledge centres also constitute an integral part of the biovillage movement launched by the M. S. Swaminathan Research Foundation with the following objectives:

- Conservation and enhancement of natural resources.
- Strengthening rural livelihoods through integrated attention to on-farm and non-farm employment.

Population-rich but land-hungry countries like India, China and Bangladesh need job-led economic growth and not jobless growth. Youth make up most of the people of most developing countries. Attracting and retaining youth into villages will be possible only by making agriculture and rural professions both intellectually stimulating and economically rewarding. Fortunately, agriculture in most developing countries is 'farmers' farming', not 'factory farming'. So modern knowledge centres help to promote eco-technologies, based on a blend of traditional knowledge and frontier technologies such as biotechnology and information, space and renewable energy technologies.

Components of eco-technologies such as integrated pest and nutrient management, scientific water harvesting and use, and harnessing renewable energies like solar, wind, biomass and biogas require timely information specific to each location. So knowledge centres in biovillages can play a valuable role in promoting both an ever-green farm revolution rooted in the principles of ecology, economics, gender and social equity, and employment generation and the economic viability of micro-enterprises supported by micro-finance.

By promoting sustainable human well-being, the *antyodaya* model of bridging the digital divide will help to demonstrate how poverty, gender inequity and environmental degradation can become problems of the past ■

M. S. Swaminathan is joint founder of the M. S. Swaminathan Research Foundation and winner of the 1994 Sasakawa Environment Prize.

Greening the screen

JOHN D. LIU describes the extraordinary potential of television in mobilizing people in developing countries for sustainable development

Imagine the ability to communicate with everyone on Earth, simultaneously and instantaneously. Imagine the ability to connect the foremost medical authorities with sufferers of debilitating and treatable diseases on the other side of the planet. Imagine the ability to explore in conditions where no human being can survive. Imagine the ability to speak to the hearts and souls of those who, from ignorance and fear, have been enemies for generations. Imagine the ability to ensure that everyone can understand and participate in conservation measures vital to the future of humanity.

Now imagine this. The camera plays over anxious faces of victims. Matt black high-calibre weapons exude professional menace matched by the discipline of the perpetrators. Tension rises by degrees as skilled cinematographers manipulate the scene and the viewers. Fear is palpable, but if you are not sufficiently terrified, the soundtrack reinforces it. Then an orgy of violence so well choreographed that the trajectory of bullets, the splattering of blood and bone, are elevated to a ballet of motion and colour.

Scenes like that are played out each day on television around the world. This is not an epic morality play. The creators are not seeking to identify and reinforce cultural values. This is entertainment. Around the world, millions of viewers are being desensitized.

Violence, vacuity, voyeurism

Other than the rare isolated exception, or the deeply thoughtful who reject TV, it is possible to reach virtually every human being on the planet with a television signal. But what kind of programming is being delivered to this massive global audience? All too often it gets a steady stream of violence, sexual innuendo or vacuous quiz shows. Even the news concentrates on disasters, sometimes replacing what should be a public service with a kind of morbid voyeurism. We are shown technically proficient but increasingly brutal professional sports. All punctuated with advertisements aimed at selling an unsustainable lifestyle.

Excellent programmes and the amazing potential of television are obscured. Hundreds of millions of viewers in the developing world are being conditioned to violence and seduced by images of affluence and excess they cannot share.

At the same time as we are being 'entertained', climate change threatens to exact an almost unthinkable toll, chemicals are destroying the protective ozone layer, the Earth is losing its forests. ▶

Barriers to understanding and sharing are being reduced as nations and individuals grasp the advantages of communicating

persistent organic pollutants find their way to the farthest reaches of the planet, the world's oceans degrade, and countless species disappear forever.

We need television to communicate the extreme dangers that the Earth and humanity face from environmental degradation; to communicate new scientific and technical breakthroughs that may help us build a sustainable future; to multiply the efforts of thoughtful and concerned citizens everywhere striving to envision and build sustainable systems; to invite and encourage everyone to reduce their own 'ecological footprint'. The purpose of this wonderful capability should not be to anaesthetize an institutionalized underclass, to deliver government propaganda or to enrich media barons.

Over the past few years the power of television has helped transform environmental awareness in China. Once virtually unknown, environmental issues have become of foremost concern to ordinary citizens.

The Environmental Education Television Project for China (EETPC) – a civil society, participatory project – is having a profound effect on how the Chinese view the natural and human environments. This international non-profit effort links Chinese academic, government and non-government organizations – including the Chinese Academy of Sciences, the Institute of Scientific and Technical Information of China, the State Environmental Protection Administration, the Friends of Nature and the Global Village – and is supported internationally by the Television Trust for the Environment (TVE International), UNEP, the World Wide Fund For Nature, the European Commission, the United Nations Development Programme, the United Nations Children's Fund, UNAIDS, the Heinrich Böll Foundation, the Jane Goodall Institute and many others.

Since it started operation less than five years ago, EETPC has brought to China hundreds of the best environmental films from all over the world, and dubbed them into Chinese; some have also been dubbed into Tibetan, Mongolian and Uighur. Hundreds of millions of people have been reached by daily and weekly environmental series including: *Earth Report*, *Earthscan*, *Our Home*, *Centuries Alarm* and *Anima Mundi – The Soul of Life*, together broadcast by EETPC with such partners as China Central Television, China Radio International Television Department, and provincial and local stations throughout China.

There is also tremendous interest in China in using audiovisual materials for environmental education. Wide participation has ensured that thousands of people and hundreds of institutions have been able to use them to reach millions of viewers. Partners including the Institute of Science and Technical Information of China, the China Youth Development Foundation and the Beijing Education Bureau have helped to manufacture and distribute videos and video CDs, empowering others to learn and teach.

Encouragement for innovation

In 1998, a retired engineer called Li Guang Yu visited the EETPC and saw a film showing how a village in India converted to biogas for lighting and cooking. Armed with a copy of the programme, and a small grant from the Canadian International Development Agency, he then built a biogas digester in his home village, Long Jia Tian in Guizhou Province. It was so successful that everyone in the village copied it, and county officials promoted it in other villages. Local people are no longer using wood for cooking where the biogas systems are in use. This is allowing trees and undergrowth to return, protecting the soil, lessening the threat of flooding and freeing people, particularly women and children, from backbreaking, destructive labour. District officials in An Shun, after studying Mr. Li's digester, now plan to build 100,000 biogas systems.

The results of Mr. Li's viewing are dramatic, but not unique. Every day, in every province of China, similar film screenings are being held. EETPC and its many partners are using television to help to educate one fifth of the world's people about why and how to protect the environment for themselves and for future generations. This is proving that television can do a great deal more to address global environmental issues and that environmental education television is especially applicable in developing countries.

The Internet is often touted as the tool for reaching the world's poor with development messages. It does indeed have tremendous potential, but it will be years, perhaps decades, before it can reach everyone. The Earth's environmental problems just will not wait.

Ordinary people can achieve excellent results when they choose to participate in educating themselves and their communities about the environment. But we need the powerful tool of television to reach everyone. Then the only limit is our imagination ■

John D. Liu is Director of the Environmental Education Television Project for China.

Images from ***Earth Report****, the weekly TV series produced by TVE in partnership with UNEP and the World Wide Fund for Nature. The programmes, broadcast first by BBC World, are screened in 170 countries worldwide.*

TAKING THE LEAD

JULIA MARTON-LEFEVRE describes creating a network of future leaders in sustainable development, and keeping them in touch with each other

The world is not adequately prepared for the great challenge of this new century – finding economically and environmentally sound paths to development. If we are to live within our economic and ecological means, there will have to be far reaching policy, institutional and technological reforms, complemented by shifts in individual values and behaviour.

Bringing about this kind of change will require a different kind of leadership. The next generation of leaders will have to create and implement policies that reflect the links between economic prosperity, a healthy environment and social equity. They will need to recognize the global nature of environmental problems, empower people to take part in the decisions that affect their lives and consider the interests of future generations.

For the last ten years, Leadership for Environment and Development (LEAD) has been identifying and training a global network of future decision makers with these values and skills – and helping them to keep in touch with each other. It encourages them to become agents of change – both individually and as a group – in their workplaces, communities, countries and beyond.

Le Hoai Phuong/UNEP/Still Pictures

LEAD – an independent, non-governmental and non-profit organization – selects promising young professionals, aged between 28 and 40, who are already emerging as potential leaders in government, business, academia, the media and non-governmental organizations (NGOs) through its 13 member programmes active in more than 60 countries, both developed and developing, on five continents. These associates take part in a rigorous two-year training programme with three equally important thrusts:

- **Providing knowledge about the complex issues of environment and development.**
- **Reinforcing existing leadership skills through training in problem solving, negotiations, conflict resolutions and systems thinking; team building; and cross-cultural, networking and communications skills.**
- **Acquiring a set of shared ethical values and attitudes towards our planet and all life on it.**

They work and study together for some 80 days over the two years, while still continuing in their jobs, both in their home countries and regions and in special international sessions. They embark on site visits, participate in discussions, explore case studies, learn through games, scenarios and role playing; and are taught how to develop presentations.

This opens them to communicating with professionals from fields, and countries, different from their own, and greatly enhances their potential to expand their knowledge, view questions from a variety of perspectives and exchange information in a very personal way.

Cooperative work

So far 1,100 potential leaders from over 40 countries have graduated from the programmes. Once they graduate, they become LEAD Fellows for life. LEAD works to sustain this network of graduates, to ensure that they remain true to the LEAD vision and to keep them in touch with each other. Fortunately, in a world made smaller through advanced telecommunications, the ability of individuals, groups and nations to communicate more effectively and build greater systems for cooperative work has expanded exponentially.

LEAD publishes newsletters, disseminated throughout member programmes, providing updates on activities, events, accomplishments, opportunities and progress within the environment/development movement. The Fellows are similarly kept informed of peer accomplishments, employment and programme opportunities via a monthly, electronic newsletter. Brochures, comprehensive training publications, audio and video tapes of training sessions are also made available both on-line and in hard copy.

But LEAD also goes far beyond traditional communications methodologies through the process by which participants glean information on environmental issues, projects and philosophies during site visits to (often) remote areas outside their typical experience. A journalist from New Delhi attending a training session might find

Lim Eng Gerald/NEPSilll Pictures

herself working in a team with a Pakistani law professor, a Brazilian environmental NGO activist, a Japanese corporate leader, and government officials from South Africa and Russia – visiting a town in Indonesia to discuss water rights with local government officials, native craftspeople and a multinational shipping company. Their training and preparation prior to the session (through written materials and e-mail communications) makes them part of an organic process of communications, learning from one another as well as from host project leaders and stakeholders.

Constant contact

When they are recruited, associates are equipped with a computer, given a CD-ROM and connected to the Internet linking them to the LEAD family. Members of LEAD and international experts on environment and development issues maintain constant contact through LEADnet, a website and database, using e-mail, on-line conferences, distance-learning training modules and written materials. The Fellows are also kept in touch with each other through this network, as well as through opportunities to meet and work together in person.

The vast wealth of shared information presents enormous potential for environmental progress

Using telecommunications as a tool to empower environmental stewards to work in a cooperative and mutually beneficial manner brings all sectors together by organizing worldwide information and knowledge in an intelligent, easily accessible and efficient way. The vast wealth of shared information presents enormous potential for environmental progress.

Thus, as the world shrinks, individual consciousness is given the opportunity to expand. LEADnet is a viable and organic meeting place, where environmentally concerned groups and people are brought into close intellectual partnership so that their ideas can come into contact with one another to grow and flourish.

The LEAD-China programme's website, EnvironInfo, has become one of the world's leading sources for information on China and the environment. More than 47 per cent of those accessing the site are from outside China – with many from the United States' Silicon Valley, and it links many multinational corporations to environmentally concerned individuals, NGOs, government regulators, academicians and media representatives.

The power of LEAD stems from the belief that people can make a difference. By identifying talented individuals, enhancing their capacities for global citizenship, and giving them contacts to other, like-minded people, their collective voices can be heard ■

Julia Marton-Lefèvre is Executive Director, LEAD International.

WANTED: more good reporters

DARRYL D'MONTE

examines the reasons for a decline in environmental coverage in the media in developing countries

The print media in the South tend to take their cue from their Western counterparts in this globalized world. The coverage of environmental issues is no exception, and there has been a backlash over environmental stories in developing countries, just as in the North. Environmental journalists are increasingly seen as do-gooders who wear green badges on their lapels and lack the objectivity their craft demands.

New priorities

Business is now the most coveted beat in newspapers, thanks to a heightened media perception of the interconnectedness of economies and the pervasive belief that economic liberalization is the key to unleashing a country's productive force. The emphasis is on hardheaded pragmatism. In practice, this often means that the concerns of politics or developers take precedence over long-term social and economic processes which have an environmental base – such as virtually perennial drought.

This is a far cry from the 1980s, when mainstream dailies in countries like India – which has some of the South's most independent media – had designated environment correspondents. Press attention reached its climax during the Earth Summit in 1992. Due to the extensive coverage at the time, the environment began to be taken seriously as a subject in its own right, rather than being regarded as a 'soft' beat, like health, generally given to women reporters.

Topham Picturepoint

Now print journalists in the South are discouraged from campaigning on issues like the environment, part of a worldwide trend against radicalism of any kind. This is particularly true of the fierce controversy over the Narmada Dam in central India where editors have often pilloried reporters for not presenting 'constructive' alternatives to the project. With the increasing moves towards the privatization of infrastructure projects, the media take the view that these big development projects should go through, as long as any adverse impacts – including the displacement of the local people – are mitigated.

A lonely furrow

Environmental journalists are being seen as a somewhat suspect specialized breed whose commitment to a cause is often stronger than to their profession. It has been left to a few small, but influential, journals and news services to plough a lonely furrow. These include *Down To Earth*, a fortnightly brought out by the Centre for Science and Environment in New Delhi; the Penang-based Third World Network, which syndicates features throughout the world; and *Suara Sam* and *Utusan Konsumer*, popular multi-lingual journals produced by Sahabat Alam (Friends of the Earth) Malaysia and the Consumers Association of Penang. Although based in Western cities, the Interpress, Panos and Gemini news services are also heavily oriented towards the coverage of environment and development issues in the South, and maintain bureaux in Southern capitals.

Some seasoned journalists remain sceptical of the bona fides of many scribes who cover the environment. Nalaka Gunawardene, the Colombo-based regional head of the Television Trust for the Environment in London, says: 'Environmental journalism would be a whole lot better if it had more of the three Ss: science, substance and (good) stories. First and last, it has to

Ron Giling/Still Pictures

be good journalism, and that requires accuracy, balance and credibility. Trying to save the world – as some environmental journalists claim to do – does not give them a licence to indulge in sloppy journalism, or to peddle conspiracy theories or half-truths.'

Nevertheless the environment beat is still treated as a crusade in many countries in the South with a shorter history of an independent press. Nguyen Diep Hoa, an environmental journalist in Hanoi, says: 'Journalists' reports have contributed significantly to raising public awareness among the public, including policy makers and local authorities. However, the press seems unable to tackle big environmental problems (for instance, building a highway and its impacts) since it is difficult to obtain information which is hidden within the top government agencies.'

Ongoing struggle

Despite some doubts, the print media in the South will have to continue to grapple with covering the environment; the degradation of the natural resource base is so severe that newspapers and magazines cannot but take notice. The shortage of water and air pollution are already staple themes in every newspaper throughout the South – and will continue to feature in the news pages for many years to come. But the more professional the coverage is, the more space it will attract, and the more effect it will have on public opinion and policy makers alike ■

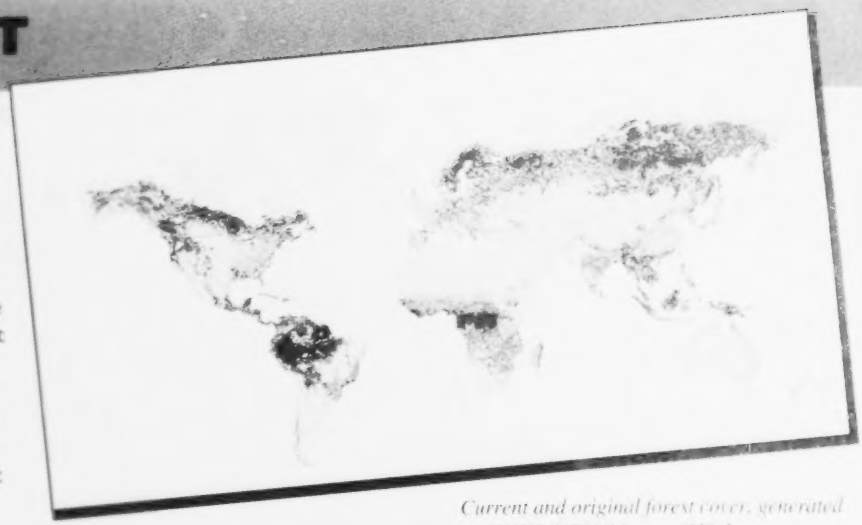
Darryl D'Monte, who is based in Mumbai, is President of the International Federation of Environmental Journalists.

TIM FORESMAN
presents 'UNEP Dot Net':
a new look at our world

Dot coms may be experiencing the roller coaster forces of the financial markets but UNEP.Net is receiving greatly deserved accolades and anticipating a rosy future for putting into practice what the world's leading Internet developers have been discussing for the past few years. What UNEP.Net has begun implementing, since its launch in February at the 21st session of the Governing Council in Nairobi, is the ability functionally to interoperate offices and databases within UNEP and with outside collaborating organizations.

What does 'functionally to interoperate' mean? Imagine that you have a cluster of meteorological stations with rainfall and temperature data for West Africa in a World Meteorological Organization database in Ghana. And you have mosquito larvae sampling data in a database at a centre of the Food and Agriculture Organization (FAO) in Rome. Then the World Health Organization maintains a malaria statistics file in Geneva for 20,000 villages for West Africa, while UNEP provides a vegetation and topographic set of maps located in the Nairobi office. These disparate databases can be harnessed for study from anywhere on the planet, using the correct search engines and collaborating web servers, to enable an individual to conceive of a question like, 'will the weather patterns experienced over the past three weeks lead to an increase in malaria outbreaks, and if so what specific microclimates would be best served by either aerial spraying or hut spraying in which villages?'

Mark Edwards/Still Pictures



Current and original forest cover, generated by UNEP-WCMC from a GIS dataset.

The technology that UNEP.Net is applying to these types of questions, and science queries, is based not only on the ability to locate and identify the existence of data and information needed to help decision-making processes, but on the ability to interoperate with the data automatically in order to achieve data integration processes required to analyse and report on these important environmental and health issues. In other words, anyone can conduct scientific studies and environmental impact assessments from their desktop using other people's data.

State-of-the-art

UNEP.Net is the current culmination of technological advances from such fields as web server interfaces, Internet map servers and geo-spatial database management. These advances in web architecture and database interoperability developed from international efforts, such as the Web Mapping Testbed of the Open GIS Consortium in combination with the Digital Earth Initiative, and the Global Spatial Data Infrastructure activities. Many agencies, such as the World Bank, FAO, the United Nations Institute for Training and Research, the World Resources Institute, the National Geographic Society and the Environmental Systems Research Institute, have joined the UNEP initiative and are voluntarily cooperating on standards, thereby making the interlinkages and interoperability facilities over the Internet a reality.

People can access these tools and data through UNEP.Net or other participating web portals in other agencies. The voluntary adherence to the international standards includes special coding for web servers, documentation protocols for database listings and catalogue listings for all information holdings.

Setting standards

What does this provide for the average government worker or interested citizen? UNEP.Net has established the trend for standards and interoperability that will greatly enhance the worth of the Internet for day-to-day and complex information query and reporting tasks. There has been an exponential increase in the availability of scientifically credible data, maps and expert information that can now be easily accessed and applied to any user's specific questions ranging from flood impacts on Mozambique to the risk of glacial lake flooding in Nepal from global warming, and from locating critical habitat for pigmy elephants to the effectiveness of forest protection in national parks. We are witnessing the first major technological leap since the creation of web pages on the Internet in the early 1990s. UNEP.Net represents an environmental scientist's tool kit at the fingertips of anyone with access to the Internet – for free ■

Tim Foresman is Director of Environmental Information, Assessment and Early Warning, UNEP.

The city century

ANNA TIBAIJUKA outlines the worldwide possibilities for sustainable development in cities

Stephen Ferry/UNEP/Still Pictures

At night, from outer space, the lights from cities, towns and villages illuminate a world wide web of human hopes and aspirations. However, with more than 3 billion people now living in urban areas and with more than 160,000 people being added to the urban population each day, each dot of light is a daily reminder that the battle for the environmental future of the planet will be won or lost in cities and towns. It is therefore fitting that, this year, World Environment Day should fall on the eve of Istanbul+5, the special session of the General Assembly for the review and appraisal of the Habitat Agenda to be held in New York, 6-8 June 2001.

Sustainable settlement

In June 1996, at Habitat II – the second United Nations Conference on Human Settlements – 171 governments met in Istanbul to commit themselves to improving the living environment in the world's settlements. By adopting the Habitat Agenda at this meeting, Member States of the United Nations and the international community endorsed the twin principles of adequate shelter for all and sustainable human settlements development. On 6 June 2001, these same governments will be invited by the United Nations General Assembly to present their achievements and to review progress on the commitments they made at Habitat II. Istanbul+5 will also lead to the formulation and prioritization of future actions and initiatives.

If ever there was a need to prioritize the problems of urbanization, it is now. Worldwide there are more than 326 cities with populations of 1 million plus. The ecological footprint of these grows exponentially and many human settlements now find themselves in competition for scarce resources. At the same time, urban areas are the main source of environmental pollution. In an age when climate change is one of the major threats confronting the planet, research shows that cities have become islands of heat.

But urban agglomerations are not just part of the problem; they are also an essential part of the solution. Human settlements offer economies of scale and possibilities for technological innovation and conservation. Well managed neighbourhoods are the key to a sustainable future. Global environmental problems can and must be tackled at the local level. This is why the successful implementation of the Habitat Agenda is so critical to the environmental future of the planet.

Good governance

The underlying message of this negotiated document is that sustainable urban development depends largely on good governance and an enabling policy environment. More than anything else, the Istanbul Conference endorsed the important role played by local authorities, the private sector, non-governmental organizations and other civil society organizations in improving the condition of human settlements. As the custodian of the Habitat Agenda, the United Nations Centre for Human Settlements has been working with these partners to find innovative ways of resolving the problems in human settlements.

One of Habitat's most important partners is UNEP. Together UNEP and Habitat have established projects that illustrate how the urban environment can be changed for the better. Their Sustainable Cities Programme is supporting the development of 'environmental profiles' in various cities. Another joint programme, Managing Water for African Cities, has set up demonstration projects in seven of the continent's cities on managing the growing urban water crisis. A third, the Urban Environment Forum links cities and their partners in international support programmes through a global network. This is a partnership of which both agencies can be proud.

Reversing trends

In an era of globalization, the possibilities for partnership are endless. Yet the reports prepared for Istanbul+5 indicate that globalization has had a detrimental effect on the poor in slums and squatter settlements. It can only be hoped that the commitments made at the special session in New York in June and at Rio+10 in South Africa next year will help alleviate the suffering of the poor and improve their living environments. At the dawn of the city century, the world wide web of possibilities must lead to an improvement in the state of the environment and in the state of our human settlements ■

Anna Tibaijuka is Executive Director, United Nations Centre for Human Settlements (Habitat).